

REMARKS

Claims 1-10, 13, and 15-33 were pending in the above-identified application when last examined and stand rejected.

Claims 1, 2, 7-9, 13, 15-18, and 22-33 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. No. 6,621,260 (Eldridge). Applicant respectfully traverses the rejection.

Independent claim 1 distinguishes over Eldridge at least by reciting, “a probe comprising a semiconductor die and probe tips on the semiconductor die, wherein the probe tips comprise bumps that are arranged in a pattern that matches a pattern of terminals on the device and that directly contact the terminals during testing of the device, the probe tips being affixed to the semiconductor die so that the pattern of the probe tips expands/contracts with thermal expansion/contraction of the semiconductor die.” Eldridge fails to disclose or suggest a test system where bumps on a semiconductor die form probe tips.

In the rejection of claim 1, the Office Action cites Figs. 15 and 27. Figs. 15 and 27 describe alternative systems and in particular, illustrate alternative structures for providing compliancy during testing. For example, in regard to Fig. 15, Eldridge beginning at column 10, line 47 describes that “Probes card 1510 is a membrane probe card that includes contact balls 1518 and 1520 that provide signals to and receive signals from die 1511.” In regard to Fig. 27, Eldridge beginning at column 14, line 46 describes that “The probe card assembly includes ... an active electronic component 2710, and spring contact element 2718 and 2720. For one embodiment, component 2710 may be an application-specific integrated circuit (ASIC).” Eldridge fails to disclose a single embodiment where contact balls (such as balls 1518 and 1520) are on a semiconductor die. Further, it would not have been obvious to modify Eldridge to use contact balls 1518 and 1520 of Fig. 15 with component 2710 because Eldridge fails to suggest that such a system would provide sufficient compliance for contacting terminals on a die being tested. Accordingly, claim 1 is patentable over Eldridge.

Claims 2, 7-9, and 29-33 depend from claim 1 and are patentable over Eldridge for at least the same reasons that claim 1 is patentable over Eldridge.

Independent claim 13 distinguishes over Eldridge at least by reciting, “forming the probe tips comprises: forming contact pads on the semiconductor die; and forming conductive bumps on a surface of the contact pads, wherein tops of the conductive bumps provide

surfaces that during testing directly contact the terminals of the semiconductor device.” As noted above, Eldridge discloses embodiments that incorporate compliance either through use of a membrane probe card 1510 as in Fig. 15 or through uses of spring contact elements 2718 and 2720 as in Fig. 27. Eldridge fails to disclose or suggest “forming contact pads on the semiconductor die; and forming conductive bumps on a surface of the contact pads, wherein tops of the conductive bumps provide surfaces that during testing directly contact the terminals of the semiconductor device” as recited in claim 13. Accordingly, claim 13 is patentable over Eldridge.

Claims 15-18 and 22-28 depend from claim 13 and are patentable over Eldridge for at least the same reasons that claim 13 is patentable over Eldridge.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 102.

Claims 3-6 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Eldridge in view of U.S. Pat. No. 5,804,983 (Nakajima). Applicant respectfully traverses the rejection.

Claims 3-6 and 10 depend from claim 1, which is patentable over Eldridge for at least the reasons given above. In particular, Eldridge fails to disclose or suggest bumps on a semiconductor die forming probe tips. The Examiner cites Nakajima for disclosing “a probe card 22 including a receptacle” and for disclosing a positioning system. However, combining such teachings with Eldridge fails to suggest, “a probe comprising a semiconductor die and probe tips on the semiconductor die” as recited in claim 1. Accordingly, claim 1 and claims 3-6 and 10, which depend from claim 1, are patentable over the combination of Eldridge and Nakajima.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 103.

Claims 19-21 were rejected under 35 U.S.C. § 103(a) as unpatentable over Eldridge in view of U.S. Pat. No. 5,513,430 (Yanof). Applicant respectfully traverses the rejection.

Claims 19-21 depend from claim 13, which is patentable over Eldridge for the reasons given above. The Examiner cites Yanof for disclosing particular methods for forming holes. However, such a teaching when considered in combination with Eldridge still fails to suggest, “forming the probe tips comprises: forming contact pads on the semiconductor die; and

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forming conductive bumps on a surface of the contact pads, wherein tops of the conductive bumps provide surfaces that during testing directly contact the terminals of the semiconductor device." Accordingly, claim 13 and claims 19-21, which depend from claim 13, are patentable over the combination of Eldridge and Yanof.

For the above reasons, Applicant requests reconsideration and withdrawal of this rejection under 35 U.S.C. § 103.

In summary, claims 1-10, 13, and 15-33 were pending in the application. This response amends claim 13 and leaves claims 1-10 and 15-33 in the form previously examined. For the above reasons, Applicant respectfully requests allowance of the application including claims 1-10, 13, and 15-33.

Please contact the undersigned attorney at (408) 927-6700 if there are any questions concerning the application or this document.

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Respectfully submitted,



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